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What is claimed is:

1. An isolated cDNA of a mammalian ELF3 gene, or fragment thereof at least 20 nucleotides long, comprising at least one intron of the ELF3 gene or a portion of an intron of the ELF3 gene.
- 5 2. The cDNA of claim 1, wherein the intron is selected from the group consisting of intron 4, intron 5, intron 6, intron 7, intron 8, and combinations thereof.
3. The cDNA of claim 1, wherein the intron is intron 4.
4. The cDNA of claim 3, wherein the intron 4 comprises SEQ ID NO:-5.
5. The cDNA of claim 1, wherein the intron is intron 5.
- 10 6. The cDNA of claim 5, wherein the intron 5 comprises SEQ ID NO:6.
7. The cDNA of claim 1, wherein the intron is intron 6.
8. The cDNA of claim 7, wherein the intron 6 comprises SEQ ID NO:7.
9. The cDNA of claim 1, wherein the intron is intron 7.
10. The cDNA of claim 1, wherein the intron 7 comprises SEQ ID NO:8.
- 15 11. The cDNA of claim 1, wherein the intron is intron 8.
12. The cDNA of claim 1, wherein the intron 8 comprises SEQ ID NO:9.
13. The cDNA of claim 1, wherein the cDNA also comprises SEQ ID NO:13.
14. The cDNA of claim 13, wherein the SEQ ID NO:13 is within intron 8.

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15. The cDNA of claim 14, wherein the SEQ ID NO:13 is between nucleotides 8762 and 8763 using the numbering of SEQ ID NO:1.

16. The cDNA of claim 1, comprising SEQ ID NO:11.

17. The cDNA of claim 1, wherein the ELF3 gene comprises a nucleotide sequence
5 encoding the amino acid sequence of SEQ ID NO:3 or SEQ ID NO:4.

18. The cDNA of claim 1, wherein the cDNA comprises the entire ELF3 gene coding region.

19. The cDNA of claim 1, comprising introns 4, 5, 6 and 7 of the ELF3 gene.

20. The cDNA of claim 1, wherein the ELF3 gene comprises the nucleotide sequence
10 of SEQ ID NO:15.

21. The cDNA of claim 20, comprising SEQ ID NO:2, wherein the cDNA may be interspersed by one or more introns.

22. The cDNA of claim 1, wherein the cDNA was prepared from a composition comprising a cell, wherein the cell further comprises genomic DNA comprising an Alu_{kwd} ,
15 wherein the Alu_{kwd} consists of SEQ ID NO:13.

23. The cDNA of claim 22, wherein the Alu_{kwd} is between nucleotides 8762 and 8763 of an ELF3 gene in the cell.

24. The cDNA of claim 1, wherein the cDNA was prepared from a composition comprising a cell, the cell obtained from a human patient being tested for breast cancer.

20 25. The cDNA of claim 24, wherein the patient is at high risk for breast cancer.

26. The cDNA of claim 22, wherein the cell is a peripheral blood mononuclear cell.

27. The cDNA of claim 22, wherein the cell was obtained from a tissue biopsy.

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28. The cDNA of claim 27, wherein the tissue biopsy was a breast tissue biopsy.
29. The cDNA of claim 1, wherein the cDNA was prepared using RT-PCR.
30. The cDNA of claim 29, wherein the cDNA was amplified using primers that are suitable for amplifying at least a portion of intron 4 of the ELF3 gene.
- 5 31. The cDNA of claim 29, wherein the cDNA was amplified using primers that are suitable for amplifying at least a portion of intron 5 of the ELF3 gene.
32. The cDNA of claim 29, wherein the cDNA was amplified using primers that are suitable for amplifying at least a portion of intron 6 of the ELF3 gene.
33. The cDNA of claim 29, wherein the cDNA was amplified using primers that are
10 suitable for amplifying at least a portion of intron 7 of the ELF3 gene.
34. A vector comprising the cDNA of claim 1.
35. A cell transfected with the vector of claim 34.
36. The cell of claim 35, wherein the cell is a prokaryote.
37. The cell of claim 35, wherein the cell is a eukaryote.
- 15 38. The cell of claim 35, wherein the vector sequence comprising the cDNA is integrated into a chromosome of the cell.
39. The cell of claim 35, wherein the vector autonomously replicates in the cell.
40. The cell of claim 35, wherein the cDNA comprises the entire ELF3 gene coding region.
- 20 41. A set of two primers, each less than 30 nucleotides in length, wherein each primer is homologous to a portion of an ELF3 gene, and (a) wherein at least one primer is homologous

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to a portion of an intron of the ELF3 gene or (b) wherein each primer is homologous to a portion of different exons of the ELF3 gene.

42. The set of two primers of claim 41, wherein the intron of the ELF3 gene is selected from the group consisting of intron 4, intron 5, intron 6, intron 7 and intron 8.

5 43. The set of two primers of claim 41, wherein the intron of the ELF3 gene is intron 8.

44. The set of two primers of claim 43, wherein one of the two primers is homologous to a region of an ELF3 gene 5' to nt8762 of the ELF3 gene, and the other of the two primers is homologous to a region of the ELF3 gene 3' to nt 8763 of the ELF3 gene.

10 45. A set of two primers, each less than 30 nucleotides in length, wherein at least one primer is at least 95% homologous to SEQ ID NO:13.

46. The set of two primers of claim 45, wherein both primers are at least 95% homologous to SEQ ID NO:13.

15 47. The set of two primers of claim 45, wherein both primers are homologous to SEQ ID NO:13.

48. The set of two primers of claim 45, wherein one primer is homologous to SEQ ID NO:13 and the other primer is homologous to a portion of an ELF3 gene.

49. The set of two primers of claim 45, wherein one primer is homologous to SEQ ID NO:13 and the other primer is homologous to an intron of an ELF3 gene.

20 50. The set of two primers of claim 49, wherein the other primer is homologous to intron 8 of the ELF3 gene.

51. A set of two primers, each less than 30 nt in length, wherein the set of primers is suitable for amplifying an ELF3 5' UTR that is at least 95% homologous to SEQ ID NO:15.

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52. The set of two primers of claim 51, wherein one primer is homologous to SEQ ID NO:15 and the other primer is homologous to an ELF3 gene.

53. An isolated nucleic acid or mimetic between about 20 nucleotides and about 5,000 nucleotides long comprising a sequence homologous to at least a portion of an intron of a human ELF3 gene.

54. The isolated nucleic acid or mimetic of claim 53, wherein the nucleotide or mimetic sequence is DNA.

55. The isolated nucleic acid or mimetic claim 53, wherein the nucleotide or mimetic sequence is RNA.

56. The isolated nucleic acid or mimetic of claim 53, wherein the intron of the human ELF3 gene is selected from the group consisting of intron 4, intron 5, intron 6, intron 7 and intron 8.

57. The isolated nucleic acid or mimetic of claim 53, wherein the intron is intron 4.

58. The isolated nucleic acid or mimetic of claim 57, wherein the sequence comprises an entire intron 4 or its complement.

59. The isolated nucleic acid or mimetic of claim 53, wherein the intron is intron 5.

60. The isolated nucleic acid or mimetic of claim 59, wherein the sequence comprises an entire intron 5 or its complement.

61. The isolated nucleic acid or mimetic of claim 53, wherein the intron is intron 6.

62. The isolated nucleic acid or mimetic of claim 61, wherein the sequence comprises an entire intron 6 or its complement.

63. The isolated nucleic acid or mimetic of claim 53, wherein the intron is intron 7.

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64. The isolated nucleic acid or mimetic of claim 63, wherein the sequence comprises an entire intron 7 or its complement.

65. The isolated nucleic acid or mimetic of claim 53, wherein the sequence is less than 2000 nucleotides long.

5 66. The isolated nucleic acid or mimetic of claim 53, wherein the sequence is less than 500 nucleotides long.

67. The isolated nucleic acid or mimetic of claim 53, wherein the sequence is less than 100 nucleotides long.

10 68. The isolated nucleic acid or mimetic of claim 53, wherein the sequence is more than 100 nucleotides long.

69. The isolated nucleic acid or mimetic of claim 53, wherein the sequence is more than 500 nucleotides long.

70. A vector comprising the sequence of claim 53.

71. A cell comprising the vector of claim 70.

15 72. A probe comprising the isolated nucleic acid or mimetic of claim 53, the probe further comprising a detectable label.

73. The probe of claim 72, wherein the detectable label is fluorescent, chemiluminescent, radioactive, or an enzyme suitable for use in an enzyme detection system.

20 74. An isolated nucleic acid or mimetic between about 20 nucleotides and about 5000 nucleotides long comprising a sequence at least 95% homologous to SEQ ID NO:13 or its complement.

75. The isolated nucleic acid or mimetic of claim 74, wherein the sequence is homologous to at least 50 nucleotides of SEQ ID NO:13.

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76. The isolated nucleic acid or mimetic of claim 74, wherein the sequence is homologous to the entire SEQ ID NO:13.

77. The isolated nucleic acid or mimetic of claim 74, wherein the sequence further
5 comprises a second sequence homologous to at least 10 consecutive nucleotides of SEQ ID NO:10 or its complement.

78. The isolated nucleic acid or mimetic of claim 77, wherein the second sequence is homologous to at least 10 consecutive nucleotides of SEQ ID NO:9 or its complement.

79. The isolated nucleic acid or mimetic of claim 77, wherein the second sequence is
10 homologous to at least 10 consecutive nucleotides immediately 5' to nucleotide 8763, or immediately 3' to nucleotide 8762 of the ELF3 gene, using the ELF3 gene sequence numbering of SEQ ID NO:1.

80. The isolated nucleic acid or mimetic of claim 74, comprising a nucleotide
sequence homologous to at least nucleotides 8752 to 8773 of SEQ ID NO: 1, with SEQ ID
15 NO:13 inserted between nucleotides 8762 and 8763.

81. An isolated nucleic acid or mimetic between about 20 nucleotides and about 5000
nucleotides long comprising a nucleotide or mimetic sequence at least 95% homologous to
SEQ ID NO:15.

82. The isolated nucleic acid or mimetic of claim 81, wherein the nucleotide or
20 mimetic sequence is homologous to SEQ ID NO:15.

83. The isolated nucleic acid or mimetic of claim 81, further comprising at least 20
nucleotides or mimetics of the 5' end of a sequence encoding SEQ ID NO:3 or SEQ ID NO:4
or its complement adjoining the 3' end of the nucleotide sequence.

84. A vector comprising the sequence of claim 70.

25 85. A cell comprising the vector of claim 84.

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86. A probe comprising the isolated nucleic acid or mimetic of claim 70, the probe further comprising a detectable label.

87. The probe of claim 86, wherein the detectable label is fluorescent or radioactive.

5 88. A pair of cell cultures, where each cell culture is of the same tissue type and is derived from a biopsy of cancerous mammalian tissue, and where one of the cell lines is of cancerous cells and the other cell line is of matched noncancerous cells.

89. The pair of cell cultures of claim 88, wherein the mammalian tissue is breast tissue.

10 90. The pair of cell cultures of claim 88, wherein the cells are myofibroblast cells or CD4+ lymphocytes.

91. A method for determining whether a patient has cancer or is at risk for cancer, the method comprising evaluating whether a cell in the patient comprises a nucleic acid sequence selected from the group consisting of an ELF3 mRNA retaining at least a portion of an intron, a sequence at least 95% homologous to SEQ ID NO: 15, and an Alu_{kwd} , wherein a patient
15 comprising at least one of those sequences has cancer or is at risk for cancer.

92. The method of claim 91, wherein the sequence is ELF3 mRNA retaining at least a portion of an intron.

93. The method of claim 91, wherein the sequence is SEQ ID NO:15.

94. The method of claim 91, wherein the sequence is Alu_{kwd} .

20 95. The method of claim 94, wherein the sequence is SEQ ID NO:13.

96. The method of claim 91, the method further comprising a polymerase chain reaction.

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97. The method of claim 96, wherein the method comprises reverse transcriptase-polymerase chain reaction.

98. The method of claim 96, wherein the polymerase chain reaction is a real time PCR.

5 99. The method of claim 91, the method further comprising a northern hybridization or a Southern hybridization.

100. The method of claim 91, the method further comprising sequencing the nucleic acid sequence.

101. The method of claim 91, wherein the cell is a PBMC.

10 102. The method of claim 91, wherein the cell is from a blood sample or a tissue biopsy.

103. The method of claim 102, wherein the cell is from a tissue biopsy and the tissue is breast tissue.

104. The method of claim 103, wherein the cell is from a tissue effusion.

15 105. A kit for evaluating whether a patient has cancer or is at risk for cancer, the kit comprising

a. the set of two primers of claim 41, and

b. instructions directing the use of the primers for determining whether a portion of the ELF3 gene amplified by the two primers is present in a nucleic acid preparation.

20 106. The kit of claim 105, wherein each primer is homologous to a portion of the ELF3 gene or the complement of the ELF3 gene, and
wherein at least one primer is homologous to a portion of an intron of the ELF3 gene,
or

25 wherein the two primers are homologous to portions of the ELF3 gene, or its complement, that flank an intron of the ELF3 gene.

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107. The kit of claim 106, wherein the intron of the ELF3 gene is selected from the group consisting of intron 4, intron 5, intron 6, intron 7 and intron 8.

108. The kit of claim 106, wherein the intron of the ELF3 gene is intron 8.

109. The kit of claim 108, wherein one of the two primers is homologous to a region
5 of an ELF3 gene 5' to nt 8762 of the ELF3 gene or its complement, and the other of the two primers is homologous to a region of the ELF3 gene 3' to nt 8763 of the ELF3 gene or its complement.

110. A kit for evaluating whether a patient has cancer or is at risk for cancer, the kit comprising
10 a. the set of two primers of claim 45, and
b. instructions directing the use of the primers for determining whether a portion of SEQ ID NO:13 amplified by the two primers is present in a nucleic acid preparation.

111. A kit for evaluating whether a patient has cancer or is at risk for cancer, the kit comprising
15 a. an isolated nucleic acid or mimetic between about 20 nucleotides and about 5,000 nucleotides long comprising a sequence, the sequence
i. homologous to at least a portion of an intron of a human ELF3 gene,
ii. at least 95% homologous to SEQ ID NO:13 or its complement, or
20 iii. at least 95% homologous to SEQ ID NO:13 or its complement;
and
b. instructions directing the use of the nucleic acid or mimetic for determining whether a nucleic acid sequence homologous to the probe is present in a sample from the patient.

25 112. The kit of claim 111, wherein the isolated nucleic acid or mimetic is on a gene chip.

113. The kit of claim 111, wherein the isolated nucleic acid or mimetic further comprises a detectable label.

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114. The kit of claim 111, further comprising instructions to sequence any nucleic acid sequence homologous to the probe that is present in the sample from the patient.

115. A method for determining whether a cell or a sample comprises a virus, the method comprising

- 5 a. adding contents of the cell or the sample to a culture, where the culture comprises a susceptible cell that is capable of acquiring a characteristic upon infection with a virus, the characteristic selected from the group consisting of intron retention of ELF-3 mRNA, and acquisition of SEQ ID NO:13 in an ELF3 gene; and
- 10 b. subsequently determining whether the susceptible cell has acquired the characteristic after addition of the contents of the cell or the sample.

116. The method of claim 115, wherein the characteristic is intron retention of ELF-3 mRNA.

117. The method of claim 115, wherein the characteristic is acquisition of SEQ ID NO:13 in an ELF3 gene.

15 118. The method of claim 114, wherein the susceptible cell is a BJAB cell.